

# Muhammad Irfan

PHD CANDIDATE · COMPUTER SCIENCE ENGINEERING

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## Research Focus & Interests

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My research focuses on cybersecurity for cyber-physical systems, with an emphasis on physical-layer security, radio frequency fingerprinting, and adversarial deep learning. I explore secure communication protocols in smart grids and embedded systems, addressing challenges such as jamming, spoofing, and device authentication through real-world testbeds and AI-driven methods.

## Education

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### PhD in Computer Science Engineering

HAMAD BIN KHALIF UNIVERSITY (HBKU)

Aug, 2022 - Nov, 2025

Doha, Qatar.

- Advisor: Dr. Gabriele Olibri

- Thesis: Physical Layer Security In Power Line Communications Via Deep Learning

- Research Interest: Smart Grid Security, Physical Layer Security, Radio Frequency Fingerprinting

### M.Sc in Computer Engineering

UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UET)

Sep, 2017 - Sep, 2019

Taxila, Pakistan.

- Advisor: Dr. Muhammad Asif Khan

- Thesis: Design and Analysis of Key-Based Substitution Box (S-Box) using Robust Chaos

### B.Sc Computer Engineering

BAHAUDDIN ZAKARIYA UNIVERSITY (BZU)

2012 - 2016

Multan, Pakistan.

- Supervisor: Engr. Yasir Aziz

- Final Year Project: Video Steganography with Least Significant Bit

## Teaching & Professional Experience

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|-----------|--|-----------------------------------|
| Fall'25   | <b>DIGI3133 -Cybersecurity Risk Management</b> , TA                                | Arkansas State University, Qatar. |
| Fall'25   | <b>CPEG462-Cybersecurity Fundamentals</b> , Teaching Assistant                     | CSE, HBKU.                        |
| Spring'24 | <b>CYSE610-Multimedia Security</b> , Teaching Assistant                            | CSE, HBKU.                        |
| Fall'23   | <b>CYSE610-Applied Cryptography</b> , Teaching Assistant                           | CSE, HBKU.                        |
| Spring'23 | <b>CPEG462-Cybersecurity Fundamentals</b> , Teaching Assistant                     | CSE, HBKU.                        |
| Fall'19   | <b>CP306-Embedded Systems &amp; Application Design</b> , Teaching Assistant        | CPED, UET.                        |
| Spring'18 | <b>CP405-Advanced Topics in Computer Engineering</b> , Teaching Assistant          | CPED UET.                         |
| 2022-2022 | <b>Research Assistant</b> , Graph Lab, University of North Texas, Denton, TX, USA. | 5-Months                          |
| 2017-2019 | <b>Research Assistant</b> , UET Taxila, Pakistan.                                  | 2-Years                           |
| 2016-2017 | <b>Android Developer</b> , AppTechnologies Multan, Pakistan.                       | 10-Months                         |

## Awards, Fellowships, & Grants

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|-----------|---|---------------|
| Dec 2024  | <b>National Cybersecurity Competition CTF</b> , Qatar University, Doha. | (QAR 1500)    |
| 2022-2026 | <b>CSE Scholarship</b> , Hamad Bin Khalifa University, Doha Qatar.      | -             |
| 2022      | <b>CSE Award</b> , University of North Texas, Denton TX USA.            | (\$ 1,000)    |
| 2017-2019 | <b>Masters Scholarship</b> , UET, Taxila Pakistan.                      | (PKR 2,80000) |
| 2018      | <b>Prime Minister Laptop</b> , Prime Minister of Pakistan.              |               |
| 2014      | <b>Chief Minister Laptop</b> , Chief Minister of Punjab, Pakistan.      |               |

## Professional Services

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**Journal**, Reviewer, Applied Soft Computing Journal

Elsevier

**Journal**, Reviewer, Trans. on Pattern Analysis and Machine Intelligence (TPAMI)

IEEE

## Mentoring & Academic Service

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| 2025      | <b>TPC Member</b> , 16th IFIP Wireless and Mobile Networking Conference | Leuven, Belgium |
| 2025      | <b>As a Reviewer</b> , 30th ESORICS                                     |                 |
| 2025      | <b>Session Chair: Wireless Communications</b> ,                         | IWCMC UAE.      |
| 2023-2024 | <b>Sammar Elgaili Khogali Suleiman</b> , Master Student                 | HBKU            |
| 2023-2024 | <b>Maryam Hamad M A Al-Malki</b> , Master Student                       | HBKU            |

## Publications

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### PEER-REVIEWED JOURNALS

|     |   |   |
|-----|---|---|
| J-1 | <b>Irfan, M.</b> , Fernandez, J. H., Omri, A., Sciancalepore, S., & Olicheri, G.<br><i>Device Fingerprinting in Power Line Communications.</i>                                      | 2025<br>Ad Hoc Networks, Elsevier. [IF 4.8] |
| J-2 | <b>Irfan, M.</b> , Omri, A., Fernandez, J. H., Sciancalepore, S., & Olicheri, G.<br><i>Detecting Jamming in Smart Grid Communications via Deep Learning.</i>                        | 2025<br>JCP, MDPI. [CiteScore 9.1]          |
| J-3 | <b>Irfan, M.</b> , & Khan, M.A.<br><i>Cryptographically Secure PRNG Design using Robust Chaotic Tent Map..</i>  | 2025<br>Cogent Engineering, T&F. [IF 2.5]   |
| J-4 | <b>Irfan, M.</b> , Sadighian, A., Tanveer, A., Al-Naimi, S. J., & Olicheri, G.<br><i>A Survey on Detection and Localization of False Data Injection Attacks in Smart Grids.</i>     | 2024<br>IET CPSTA. [IF 0.8]                 |
| J-5 | <b>Irfan, M.</b> , Ali, A., Khan, M. A., Ehatisham-ul-Haq, M., Mahmood Shah, S. N., Saboor, A., & Ahmad, W.<br><i>PRNG design using hyper-chaotic modified robust logistic map.</i> | 2020<br>Electronics, MDPI. [IF 2.6]         |

### PEER-REVIEWED CONFERENCES

|     |   |  |
|-----|---|--|
| C-1 | <b>Irfan, M.</b> , Al-Malki, M., Olicheri, G., Sciancalepore, S., Hamdoui, B., & Fernandez, J. H.<br><i>Radio Jamming Against Device Fingerprinting in Power Line Communications.</i> | 2025<br>CCNC, IEEE. [Accepted, Rank B] |
| C-2 | <b>Irfan, M.</b> , Sciancalepore, S., & Olicheri, G.<br><i>Shifting Signatures: The Ephemeral Nature of the RF on the USRP X310</i>   | 2025<br>CNS (W), IEEE. [Rank A]        |
| C-3 | <b>Irfan, M.</b> , Sciancalepore, S., & Olicheri, G.<br><i>Preventing Radio Fingerprinting through Low-Power Jamming.</i>   | 2025<br>AsiaCCS, ACM. [Rank 20.4%]     |
| C-4 | <b>Irfan, M.</b> , Al-Malki, M., Sciancalepore, S., & Olicheri, G.<br><i>Radio Frequency Fingerprinting: Models, Methodologies and Performance.</i>                                   | 2024<br>IWCMC. IEEE. [Rank B]          |
| C-5 | <b>Irfan, M.</b> , Khan, M. A., & Olicheri, G.<br><i>Design of Key-dependent S-Box using Chaotic Logistic Map for IoT-Enabled Smart Grid Devices.</i>                                 | 2024<br>SGRE, IEEE.                    |
| C-6 | <b>Irfan, M.</b> , Omri, A., Hernandez, J., Sciancalepore, S., & Olicheri, G.<br><i>Jamming Detection in Power Line Communications Leveraging Deep Learning Techniques.</i>           | 2023<br>ISNCC, IEEE. [Rank C]          |

### BOOK CHAPTER

|      |   |      |
|------|---|------|
| BC-1 | <b>Irfan, M.</b> , & Olicheri, G.<br>Security and Privacy for Smart Grid Communications. [Inprogress] | 2025 |
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## References

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| <b>Dr. Gabriele Olicheri</b><br>ASSOCIATE PROFESSOR & PHD ADVISOR<br>College of Science and Engineering | HBKU, Doha, Qatar.<br>goligeri@hbku.edu.qa   |
| <b>Dr. Savio Sciancalepore</b><br>ASSISTANT PROFESSOR<br>Department of Mathematics and Computer Science | TU/e, Netherlands.<br>s.sciancalepore@tue.nl |

**Dr. Javier Hernandez Fernandez**  
TECHNICAL DIRECTOR  
Iberdrola Innovation Middle East Doha Qatar.

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